

REMARKS:

Applicants note that this response uses the new revised format for amendments set forth at <http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/revamdtprac.htm>.

Status

After this response, claims 1 to 71 are pending. Claims 1 to 3, 6 to 10, 12, 13, 18 to 20, 23 to 27, 29, 30, 35 to 37, 40 to 44, 46, 47, 52 to 54, 56 to 61, 63 and 64 have been amended. Claims 1, 18, 35 and 52 are the independent claims. Reconsideration and further examination are respectfully requested.

Claim Objections and § 112 Rejections

Claims 1 to 51 were objected to. Claims 1 to 17, 26, 27, 43, 44, and 56 to 61 were rejected under 35 U.S.C. § 112, ¶ 2. Applicants have amended the claims to address the issues raised in these objections and rejections, withdrawal of which is respectfully requested.

§ 102 and 103 Rejections

Claims 1 to 6, 18 to 23, and 35 to 40 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,864,655 (Dewey). Claims 7, 8, 12 to 17, 24, 25, 29 to 34, 41, 42, and 46 to 51 were rejected under 35 U.S.C. § 103(a) over Dewey. Claims 11, 28 and 45 were rejected under §

103(a) over Dewey in view of U.S. Patent No. 5,666,511 (Suganuma). Claims 52 to 59 and 62 to 71 were rejected under § 103(a) over U.S. Patent No. 5,758,057 (Baba) in view of Dewey.

Claims 1 to 17: Amended claim 1 is reproduced below for the Examiner's convenience:

1. An apparatus, including
a mass storage device including one or more disk drives, each disk drive having a plurality of storage blocks, each of said storage blocks including a plurality of sectors;
wherein each storage block of said plurality of storage blocks includes a data portion and an error code portion, said data portion storing data for said storage block, and said error code portion being responsive to said data portion.

The art applied against claim 1, namely Dewey, is not seen to disclose or to suggest the foregoing features of claim 1, at least with respect to each storage block including a data portion and an error code portion responsive to the data portion, with a plurality of such storage blocks on a disk drive.

In the Office Action, Dewey's parity blocks P1 to P4 were equated with the claimed error code portion. However, in view of Dewey's Figures 2A, 2B, 4A, and the descriptions thereof, Applicants understand Dewey's parity blocks to be on different disks than the corresponding data. This is believed to be entirely different from the arrangement now recited by claim 1, in which a storage block *on a disk drive* has both the data and the error code portion responsive to the data portion.

Applicants believe that the parity also is on different disks from the corresponding data in Suganuma, which was applied against some of the dependent claims. See, e.g., Figures 14A, 14B, 15A, 15B, 16A, 16B, 17, and the descriptions thereof in Suganuma.

In view of the foregoing, reconsideration and withdrawal are respectfully requested of the §§ 102(a) and 103(b) rejections of claim 1 and its dependent claims 2 to 17. Allowance of these claims also is requested.

Claims 18 to 34: Amended claim 18 is reproduced below for the Examiner's convenience:

18. An apparatus, including
a mass storage device including one or more disk drives, each disk drive having a plurality of storage blocks, each of said storage blocks including a plurality of said sectors;
wherein for each storage block of said plurality of storage blocks, a first subset of said storage block is responsive to data for said storage block, a second subset of said storage block is responsive to error code information, and said error code information is responsive to said data.

The art applied against claim 18, namely Dewey, is not seen to disclose or to suggest the foregoing features of claim 18, at least with respect to each storage block including a first subset responsive to data and a second subset responsive to error code information that is in turn responsive to that data, with a plurality of such storage blocks on a disk drive.

In the Office Action, Dewey's parity blocks P1 to P4 were equated with the claimed error code information. However, in view of Dewey's Figures 2A, 2B, 4A, and the descriptions thereof, Applicants understand Dewey's parity blocks to be on different disks than the corresponding data. This is believed to be entirely different from the arrangement now

recited by claim 18, in which a storage block *on a disk drive* has both the first subset responsive to the data and the second subset responsive to the error code information.

Applicants believe that the parity also is on different disks from the corresponding data in Suganuma, which was applied against some of the dependent claims. See, e.g., Figures 14A, 14B, 15A, 15B, 16A, 16B, 17, and the descriptions thereof in Suganuma.

In view of the foregoing, reconsideration and withdrawal are respectfully requested of the §§ 102(a) and 103(b) rejections of claim 18 and its dependent claims 19 to 34. Allowance of these claims also is requested.

Claims 35 to 51: Amended claim 35 is reproduced below for the Examiner's convenience:

35. A method for protecting data from data storage errors, said method including
determining a plurality of storage blocks in a disk drive of a mass storage system having one or more disk drives, each of said storage blocks including a plurality of sectors;
for each storage block of said plurality of storage blocks, dividing said storage block into a first subset and a second subset, and generating error code information responsive to data for a plurality of said sectors in said storage block;
wherein for each said storage block, said first subset is responsive to said data, and said second subset is responsive to said error code information.

The art applied against claim 35, namely Dewey, is not seen to disclose or to suggest the foregoing features of claim 35, at least with respect to dividing a storage block into a first subset and a second subset, wherein for each storage block, the first subset is responsive to

data, and the second subset is responsive to error code information that is responsive to the data, with a plurality of such storage blocks on a disk drive.

In the Office Action, Dewey's parity blocks P1 to P4 were equated with the claimed error code information. However, in view of Dewey's Figures 2A, 2B, 4A, and the descriptions thereof, Applicants understand Dewey's parity blocks to be on different disks than the corresponding data. This is believed to be entirely different from the arrangement now recited by claim 35, in which a storage block *on a disk drive* has both the first subset responsive to the data and the second subset responsive to the error code information.

Applicants believe that the parity also is on different disks from the corresponding data in Suganuma, which was applied against some of the dependent claims. See, e.g., Figures 14A, 14B, 15A, 15B, 16A, 16B, 17, and the descriptions thereof.

In view of the foregoing, reconsideration and withdrawal are respectfully requested of the §§ 102(a) and 103(b) rejections of claim 35 and its dependent claims 36 to 51. Allowance of these claims also is requested.

Claims 52 to 71: Amended claim 52 is reproduced below for the Examiner's convenience:

52. A method for efficiently detecting data errors in a mass storage system, said mass storage system including one or more disk drives, each disk drive having a plurality of storage blocks composed of a collection of sectors, including
reading data and error code information located in each of said storage blocks in a single operation;

calculating run-time error code information for said data located in storage blocks; and
comparing said error code information with said run-time error code information.

The art applied against claim 52, namely Baba and Dewey, alone or in combination, is not seen to disclose or to suggest the foregoing features of claim 52, at least with respect to reading data and error code information located in each of a plurality of storage blocks in a single operation, with such storage blocks on a disk drive.

Baba stores "redundant data" in a disk drive 100g, which is denoted with a "P" in Figure 5. Thus, Applicants understand Baba to keep this redundant data on a separate drive from the corresponding data drives D0 to D3. Likewise, Dewey's parity blocks are understood by Applicants to be on different disks than the corresponding data. This is believed to be entirely different from the arrangement in claim 52's step of reading data and error code information located in each of a plurality of storage blocks in a single operation, with such storage blocks *on a disk drive*.

In view of the foregoing, reconsideration and withdrawal are respectfully requested of the §§ 102(a) and 103(b) rejections of claim 52 and its dependent claims 53 to 71. Allowance of these claims also is requested.

Closing

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at (614) 486-3585. All correspondence should continue to be directed to the address indicated below.

Respectfully submitted,



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